

CLAIMS

1. An information recording method for recording information onto an optical information recording medium having an information recording layer to which information is recorded using holography, comprising the steps of:

generating virtual information light composed of information light to which information is added by spatially modulating at least a part of light ray flux emitted from a light source and of recording-specific reference light; and

irradiating virtual information light and virtual recording-specific reference light onto said information recording layer so that information is recorded to said information recording layer by interference pattern generated by interference between said virtual information light and said virtual recording-specific reference light.

2. The optical information recording method according to claim 1, wherein the interference pattern generated by interference between said virtual information light and said recording-specific reference light is recorded in a plurality of regions of said information recording layer so that said virtual recording-specific reference light comes under same condition.

3. The optical information recording method according to claim 2, wherein said plurality of regions do not overlap with each other.

4. The optical information recording method according to claim 2 or 3,

wherein said virtual information light and said recording-specific reference light are irradiated, while rotating said optical information recording medium, onto said plurality of regions by rotating said virtual recording-specific reference light with said virtual information light being the center at the same angular rate and in the same direction as that of said optical information recording medium.

5. An optical information recording method for recording interference pattern generated between virtual information light and virtual recording-specific reference light in irradiation regions as information by irradiating said virtual information light composed of information light to which information is added by performing spatial modulation and of said recording-specific reference light, and said virtual recording-specific reference light onto an optical information recording medium having an information recording layer to which information is recorded using holography, comprising the steps of:

recording a first information group by forming a plurality of first irradiation regions through irradiating said virtual information light and said virtual recording-specific reference light under a first condition onto a plurality of areas of said optical recording medium; and

recording a second information group by forming a plurality of second irradiation regions through irradiating said virtual information light and said virtual recording-specific reference light under a second condition onto a plurality of areas of said optical recording medium being overlapped with said first irradiation regions.

6. The optical information recording method according to claim 5, wherein said plurality of first regions do not overlap with each other.

7. The optical information recording method according to any one of claims 1 to 6, wherein an optical axis of said information light and an optical axis of said recording-specific reference light are on the same line.

8. The optical information recording method according to any one of claims 1 to 7, wherein said virtual recording-specific reference light is parallel light.

9. An optical information recording method for recording information recorded in a first optical information recording medium onto a second optical information recording medium, said information of said first optical recording medium being recorded by interference pattern generated between virtual information light and virtual recording-specific reference light in irradiation regions by irradiating said virtual information light composed of information light to which information is added by performing spatial modulation and of said recording-specific reference light, and said virtual recording-specific reference light onto said first optical information recording medium having an information recording layer to which information is recorded using holography, comprising the steps of:

irradiating virtual reproduction-specific reference light under same condition as that of said virtual recording-specific reference light onto said first

optical recording medium;

irradiating said virtual information light generated from said information recording layer by irradiation of said virtual reproduction-specific reference light onto said second optical information recording medium; and

recording interference pattern generated between information light and recording-specific reference light of said virtual information light in an information recording layer of said second optical information recording medium.

10. The optical information recording method according to claim 9, wherein said virtual reproduction-specific reference light is irradiated onto a plurality of said irradiation regions of said information recording layer of said first optical information recording medium and a plurality of sets of said virtual information light are reproduced from said plurality of irradiation regions at once.

11. The optical information recording method according to 10, wherein said virtual reproduction-specific reference light is irradiated onto entire surface of said information recording layer of said first optical information recording medium.

12. The optical information recording method according to any one of claims 9 to 11, wherein said virtual reproduction-specific reference light is phase-conjugate with said virtual recording-specific reference light.

13. The optical information recording method according to any one of

claims 9 to 11, wherein said virtual reproduction-specific reference light is irradiated onto said first optical information recording medium in the direction opposite from that of said virtual recording-specific reference light.

14. The optical information recording method according to any one of claims 9 to 13, wherein said virtual information light generated from said information recording layer of said first optical information recording medium is irradiated onto said second optical information recording medium by changing magnification.

15. The optical information recording method according to any one of claims 9 to 13, wherein said virtual information light generated from said information recording layer of said first optical information recording medium is irradiated onto said second optical information recording medium with a first lens having a first focal length and a second lens having a second focal length being interposed therebetween.

16. The optical information recording method according to claim 14 or 15, wherein said interference pattern that is generated between said information light of said virtual information light recorded in said information recording layer of said second optical information recording medium and virtual recording-specific reference light is reproduced by light with wavelength that is different from wavelength of said virtual reproduction-specific reference light.

17. The optical information recording method according to any one of

claims 9 to 16, wherein said first optical information recording medium is larger than said second optical information recording medium.

18. An optical information recording method for recording information recorded in a first optical information recording medium onto a second optical information recording medium, said information of said first optical recording medium being recorded by interference pattern generated between virtual information light and first virtual recording-specific reference light in irradiation regions by irradiating said virtual information light composed of information light to which information is added by performing spatial modulation and of said recording-specific reference light, and said first virtual recording-specific reference light onto said first optical information recording medium having an information recording layer to which information is recorded using holography, comprising the steps of:

irradiating virtual reproduction-specific reference light under same condition as that of said first virtual recording-specific reference light onto said first optical information recording medium;

irradiating said virtual information light generated from said information recording layer by irradiation of said virtual reproduction-specific reference light onto said second optical information recording medium;

irradiating second virtual recording-specific reference light onto said second optical information recording medium; and

recording interference pattern between said virtual information light and said second recording-specific reference light in said information recording layer

of said second optical information recording medium.

19. The optical information recording method according to claim 18, wherein said virtual reproduction-specific reference light is irradiated onto a plurality of said irradiation regions of said information recording layer of said first optical information recording medium and a plurality of sets of said virtual information light are reproduced from said plurality of irradiation regions at once.

20. The optical information recording method according to claim 19, wherein said second virtual recording-specific reference light is irradiated onto a plurality of irradiation regions to which said plurality of sets of virtual information light are irradiated.

21. The optical information recording method according to 19, wherein said virtual reproduction-specific reference light is irradiated onto entire surface of said information recording layer of said first optical information recording medium.

22. The optical information recording method according to 21, wherein said second virtual recording-specific reference light is irradiated onto entire surface of said second optical information recording medium.

23. The optical information recording method according to any one of claims 18 to 22, wherein said virtual reproduction-specific reference light is

phase-conjugate with said first virtual recording-specific reference light.

24. The optical information recording method according to any one of claims 18 to 22, wherein said virtual reproduction-specific reference light is irradiated onto said first optical information recording medium in the direction opposite from that of said first virtual recording-specific reference light.

25. The optical information recording method according to any one of claims 18 to 24, wherein said virtual information light generated from said information recording layer of said first optical information recording medium is irradiated onto said second optical information recording medium by changing magnification.

26. The optical information recording method according to any one of claims 18 to 24, wherein said virtual information light generated from said information recording layer of said first optical information recording medium is irradiated onto said second optical information recording medium with a first lens having a first focal length and a second lens having a second focal length being interposed therebetween.

27. The optical information recording method according to any one of claims 18 to 26, wherein said second virtual recording-specific reference light is spatially modulated.

28. An optical information recording medium, comprising an information

recording layer for recording information by interference pattern generated between virtual information light composed of information light and of recording-specific reference light, and virtual recording-specific reference light using holography, and for generating said virtual information light recorded when said virtual recording-specific reference light is irradiated.

29. The optical information recording medium according to claim 28, wherein the interference pattern generated between said virtual information light and said recording-specific reference light is recorded in a plurality of regions of said information recording layer, and said virtual information light is generated from said plurality of regions when same said virtual reproduction-specific reference light is irradiated onto said plurality of regions.